Kine

KINE: DATABASE SYSTEM DESIGN INSPIRED BY NEQUI

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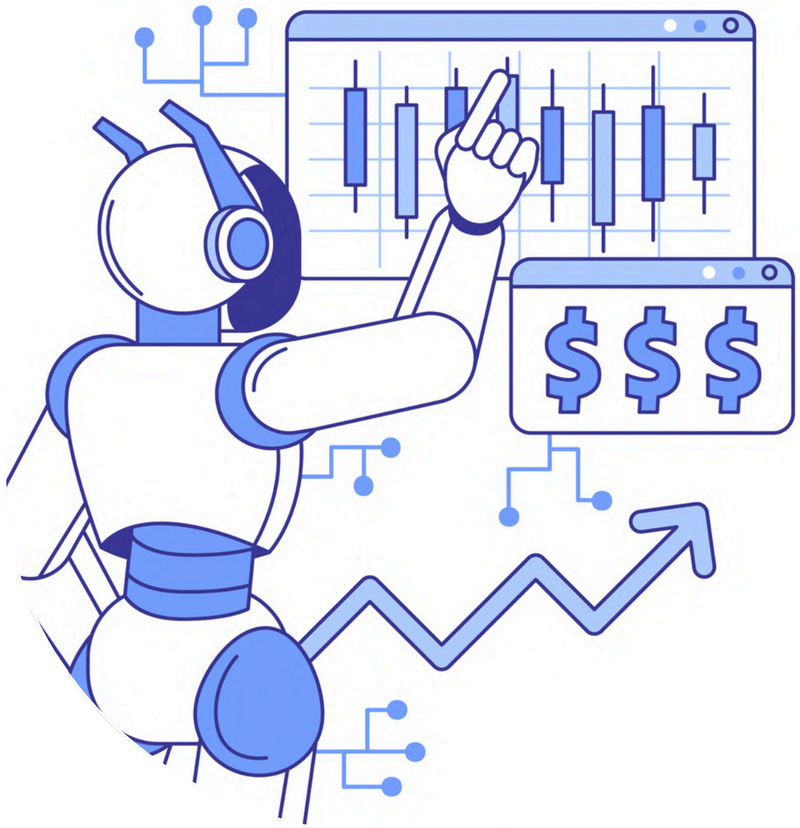
FINTECH CONCEPT – NEQUI

Kine is a fintech app inspired by Nequi.

Nequi is a 100% digital banking platform in Colombia

It provides mobile-first financial services:

- Instant transfers
- Bill payments, top-ups, and credits



USER STORIES

- User Registration and Authentication
- Balance Inquiry and Account Movements
- Money Transfers
- Support Management
- Expense Management with Pockets and Cushion

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REQUIREMENTS

Nequi processes more than 38 million transactions daily—about 26,400 transactions per minute—and serves 21.3 million active customers, according to its CEO. To absorb a load of this magnitude, Kine requires a motor that guarantees strict integrity and proper concurrency. (References)

Functional

- User registration
- Transaction logging (Movements)
- Account registration
- Support request log

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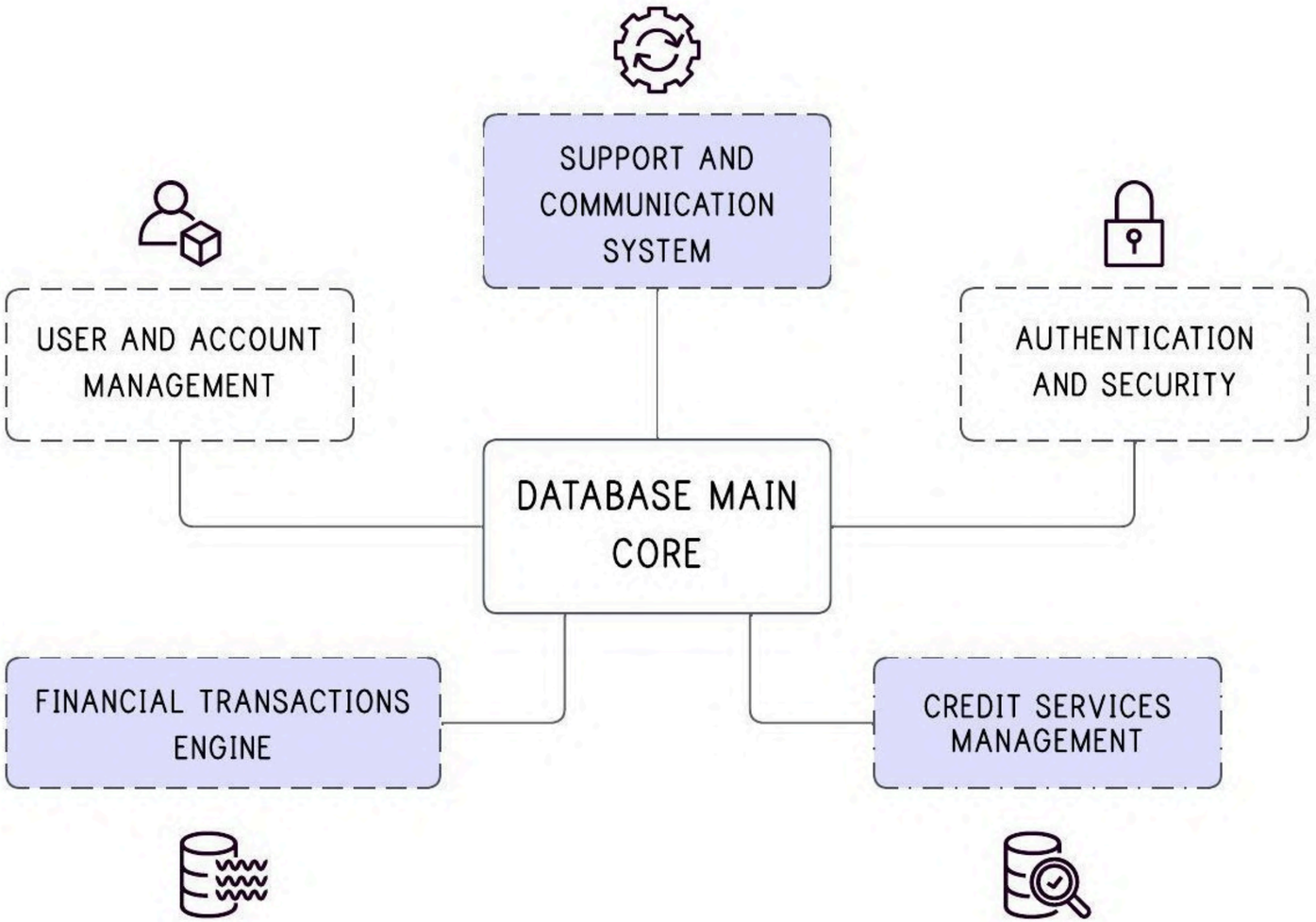
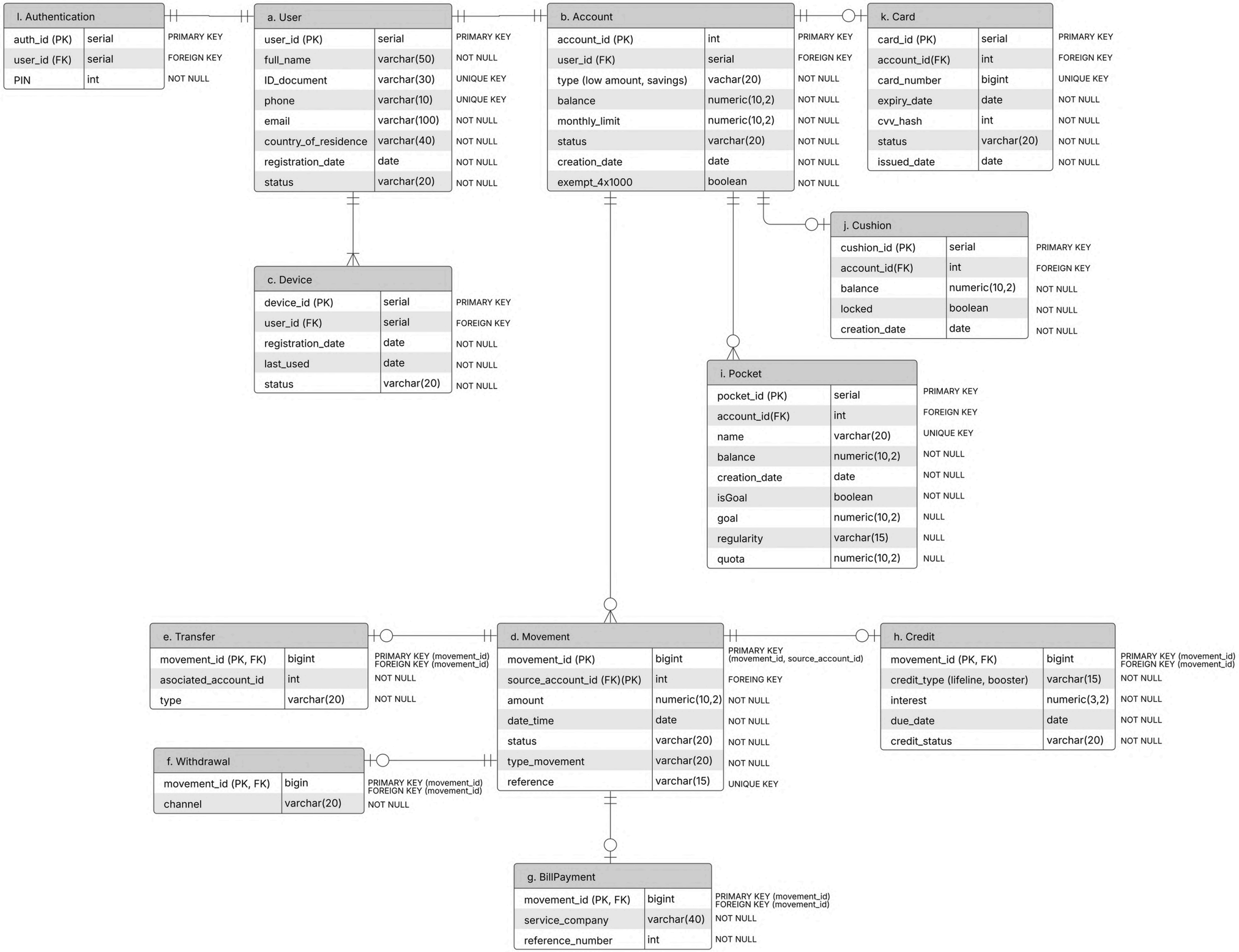
Non-Functional

- 463 transactions/movements per second
- Integrity ACID
- Consistency ACID
- Atomicity ACID

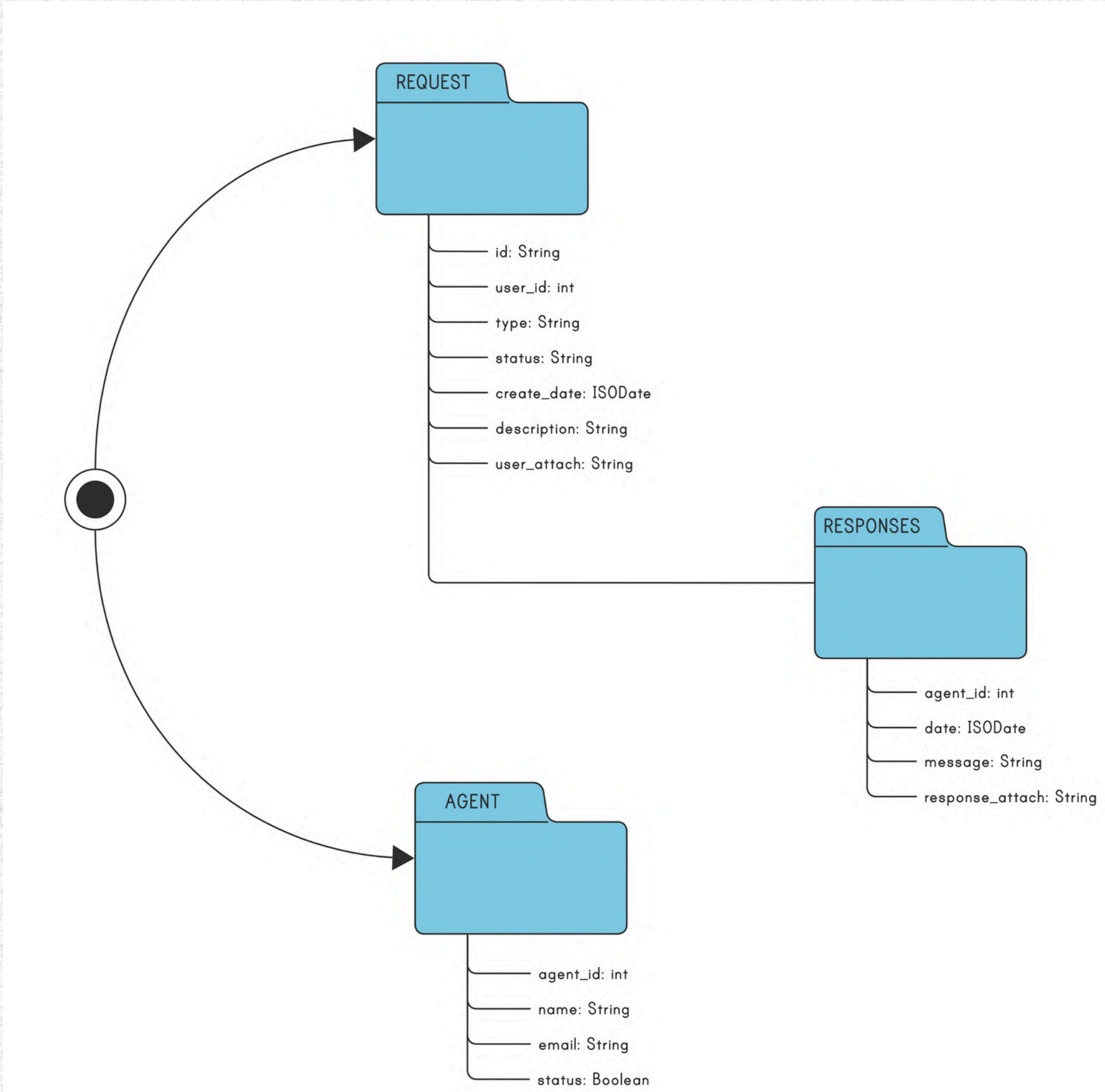
MODULAR MODEL ER BY COMPONENTS - STEP ONE ER



ENTITY-RELATIONSHIP (ER) MODEL DEFINITIVE - TRANSACTIONAL CORE



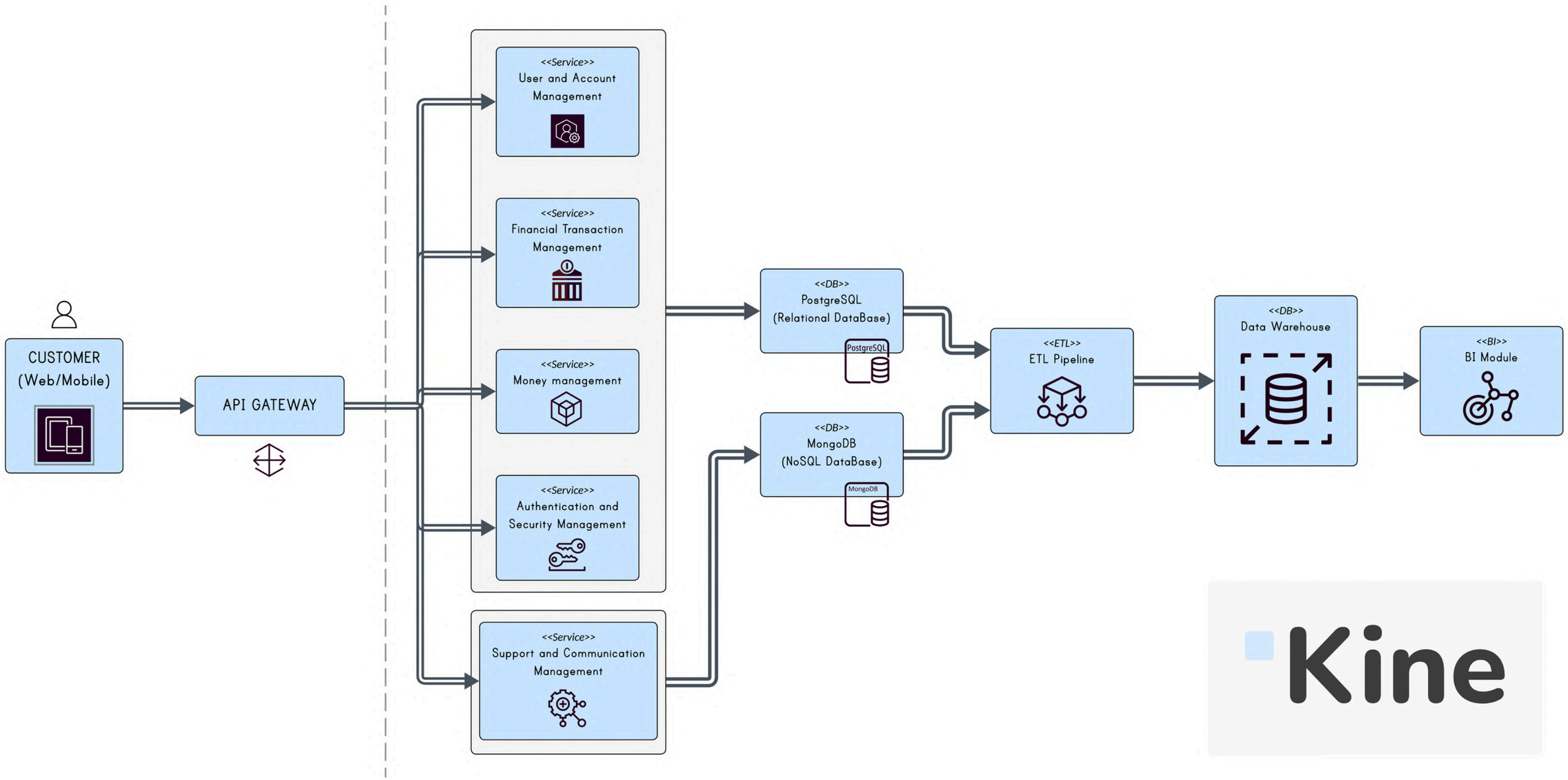
SUPPORTING CORE - DOCUMENT MODEL



TECHNOLOGIES USED

- PostgreSQL is our transactional core:
  - Ensures ACID compliance for sensitive operations (e.g., money transfers).
  - Supports strong constraints, relationships, and financial integrity.
  - PostgreSQL's built-in pgbench tool (TPC-B-style workload) typically achieves ~900 TPS with 10 clients on standard hardware
- MongoDB is our supporting core:
  - Stores flexible, unstructured data (e.g., logs, documents, session data).
  - Ideal for horizontal scaling and rapid access to non-relational content.

SYSTEM ARCHITECTURE



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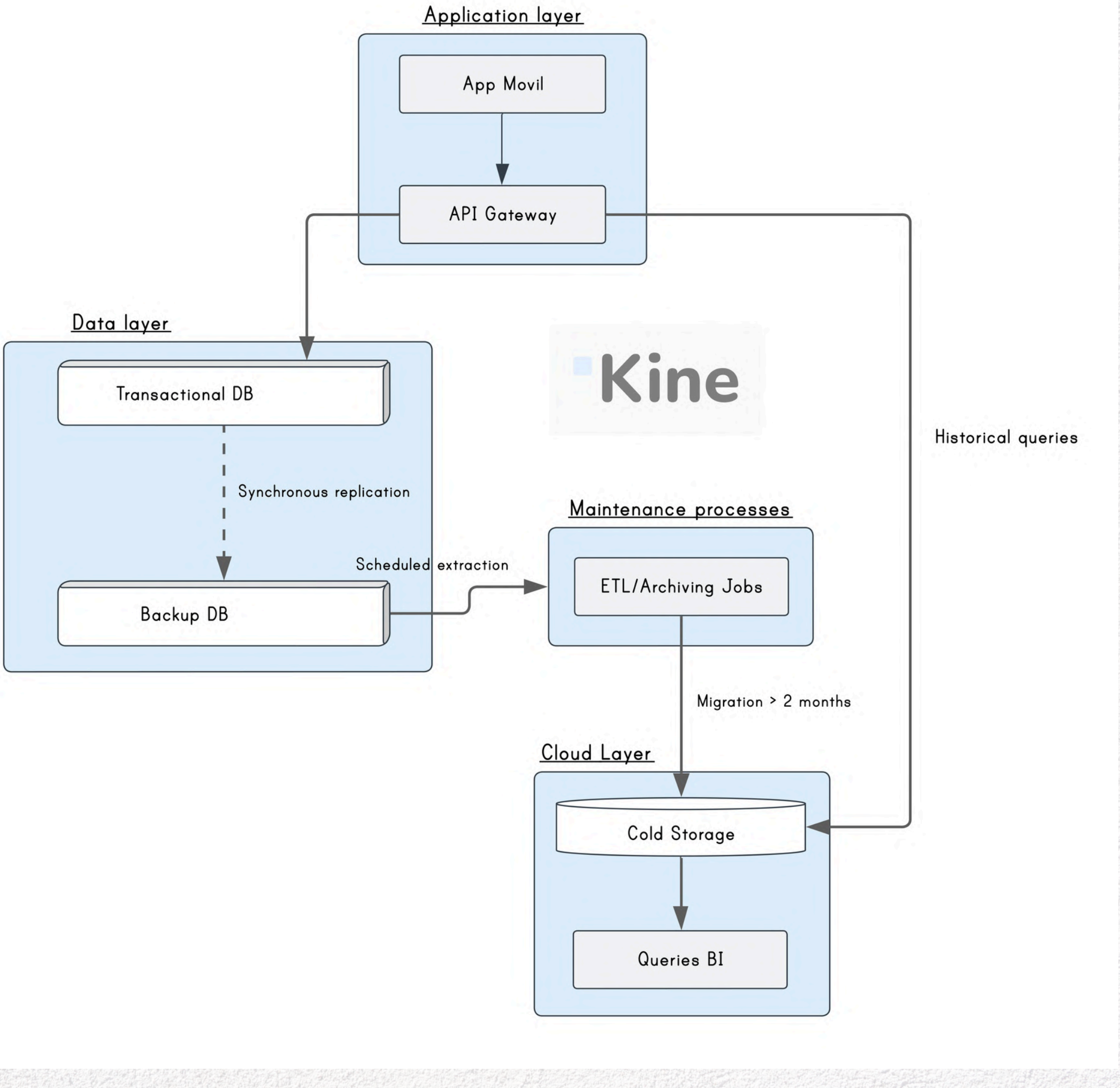
CLOUD-BASED DISTRIBUTED SYSTEM



WHY DISTRIBUTED DB?

Kine adopts a distributed architecture to ensure high availability and regulatory compliance in a real-time transactional environment.

Unlike parallel databases, it prioritizes fast, consistent operations over complex analytics.

- This model allows us to efficiently separate operational and historical data, reduce infrastructure costs, and maintain data integrity for millions of users.

THANKS

REFERENCES

- PostgreSQL Global Development Group, “pgbench — run a benchmark test on PostgreSQL,” PostgreSQL Documentation, recently updated. Typical performance of ~896.97 TPS in default environments with 10 clients is mentioned.
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- PostgreSQL Global Development Group, *PostgreSQL Performance: Benchmarks and Use Cases*, 2023. [Online]
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